

What is claimed is:

1. A cell driving type actuator wherein a plurality of piezoelectric/electrostrictive elements are arranged in alignment like teeth of a comb on a base plate and said actuator is a piezoelectric/electrostrictive actuator being driven by means of dislocation of piezoelectric/electrostrictive elements,

characterized in that each of cells is formed independently from its adjacent cells by closing respective planes being positioned between two adjacent piezoelectric/electrostrictive elements and facing the base plate with respective cover plates.

2. A cell driving type actuator according to claim 1, wherein the polarization field of said piezoelectric/electrostrictive elements and the driving electric field are aligned in the same direction.

3. A cell driving type actuator according to claim 1, wherein the degree of profile for the surface of said cell is approximately 8 μm or less.

4. A cell driving type actuator according to claim 1, wherein the ratio of the minimum spacing between the

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adjacent piezoelectric/electrostrictive elements forming said cell to the minimum spacing between said base plate and said cover plate is approximately 1:2 to 1:40.

5 5. A cell driving type actuator according to claim 1, wherein the ratio of the spacing between said cell and the adjacent cell to the minimum spacing between said base plate and said cover plate is approximately 1:2 to 1:40.

10 6. A cell driving type actuator according to claim 1, wherein the minimum spacing between the adjacent piezoelectric/electrostrictive elements forming said cell is approximately 60 μm or less.

15 7. A cell driving type actuator according to claim 1, wherein the spacing between said cell and the adjacent cell is approximately 50 μm or less.

20 8. A cell driving type actuator according to claim 1, wherein the surface roughness R_t of the wall surfaces of the piezoelectric/electrostrictive elements is approximately 10 μm or less, said elements facing one another and forming said cell.

25 9. A cell driving type actuator according to claim 1,

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wherein the width of the comb-like piezoelectric/
electrostrictive elements varies from a recess to the front
end of the comb tooth.

5 10. A cell driving type actuator according to claim 1,
wherein the spacing between the adjacent piezoelectric/
electrostrictive elements forming said cell, or the spacing
between said cell and the adjacent cell has at least two
different values.

10 11. A liquid discharging device equipped with the cell
driving type actuator according to claim 1, wherein, each
cell is used as a liquid pressurizing chamber, and said
piezoelectric/electrostrictive elements are displaced by
15 applying a driving electric field thereto in the same
direction as the polarization field of said
piezoelectric/electrostrictive elements, thus deforming said
liquid chamber, thereby enabling a liquid filled in said
liquid chamber to be discharged in the direction of the
20 front end of the comb teeth.

12. A method for manufacturing, by utilizing a punch and a
die, a cell driving type actuator wherein a plurality of
piezoelectric/electrostrictive elements are arranged in
25 alignment like teeth of a comb on a base plate; each cell

being formed by closing two adjacent piezoelectric/
electrostrictive elements disposed on the base plate with a
cover plate positioned at a plane facing the base plate in
such a manner that said cell is formed independently from
5 its adjacent cells,

characterized in that said method comprises the steps
of:

providing a plurality of green sheets made of
piezoelectric/electrostrictive material,

10 machining slit apertures in all of said green sheets
with said punch, laminating all the green sheets after
positioning them, thus forming comb-like piezoelectric/
electrostrictive elements.

15 13. A method for manufacturing, by utilizing a punch and a
die, a cell driving type actuator wherein a plurality of
piezoelectric/electrostrictive elements are arranged in
alignment like teeth of a comb on a base plate; each cell
being formed by closing two adjacent piezoelectric/
20 electrostrictive elements disposed on the base plate with a
cover plate positioned at a plane facing the base plate in
such a manner that said cell is formed independently from
its adjacent cells,

characterized in that said method comprises:

25 a step of providing a plurality of green sheets made of

piezoelectric/electrostrictive material,

a first step of machining first slit apertures in a first green sheet with the punch,

5 a second step of moving the first green sheet upwards into tight contact with a stripper in the state of not withdrawing the punch from the first slit apertures,

a third step of moving the punch upwards in such a way that the front end of the punch is withdrawn slightly from the lowest part of the first green sheet which moves upwards,

10 a fourth step of machining second slit apertures in a second green sheet with the punch,

a fifth step of moving the second green sheet upwards, together with the first green sheet in the state of not withdrawing the punch from the second slit apertures,

15 and a sixth step of moving the punch upwards in such a way that the front end of the punch is withdrawn slightly from the lowest part of the second green sheet which moves upwards, and thereafter,

20 laminating a plurality of green sheets by repeating the fourth to sixth steps so as to form a plurality of comb-like piezoelectric/electrostrictive layers.

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